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1. Some New Fruits

Plum, Cherry, Pear, Apple

2. Some New Alfalfas

and Other Forage Plants for Dry Uplands

Department of Horticulture, South Dakota State College of Agriculture
and Mechanic Arts, Brookings, South Dakota

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PROGRESS WITH MANITOBA NATIVE PLUMS

Some years ago I obtained some wild plums (*Prunus nigra*) from near Stonewall, Manitoba, and out of many seedlings two were selected and propagated under the names Winnipeg and Assiniboin as noted in my Bulletin 130. These have been tested at various places at the North, especially in their native region, and have won favor. Here at Brookings the Manitoba plums are characterized by small size of tree, but extremely early season of fruit. In fact, they are the earliest of all the native plums, but are not needed for the main market here since at Brookings we can raise larger and better plums owing to our later season.

In the endeavor to improve the fruit in size and quality I have made a number of hybrids of the Manitoba wild plum with choice plums from California. None of these hybrids are as large as Waneta so will probably be planted mainly at the North. The trees are productive and the large red fruit is of excellent quality. The names are all of Indian tribes of the far North, especially Manitoba.



THE OJIBWA PLUM

Offered for the first time. Pedigree: Shiro x Manitoba wild plum pollen. Since the Shiro, one of Luther Burbank's plums, is a complex hybrid of four species, the Ojibwa will be a mixture of five different species of *Prunus*: *Nigra*, *Angustifolia*, *Cerasifera*, *Triflora*, *Simoni*.

Available stock 55 trees, one year buds on native Americana plum roots. Price, each \$1.00.

THE CREE PLUM

Offered for the first time. Pedigree: Manitoba wild plum x Combination plum pollen. When introduced in 1901 by Luther Burbank the Combination was considered the best in quality of 25,000 seedlings.

Available stock 48 trees, one year buds on native Americana plum roots. Price, each \$1.00.

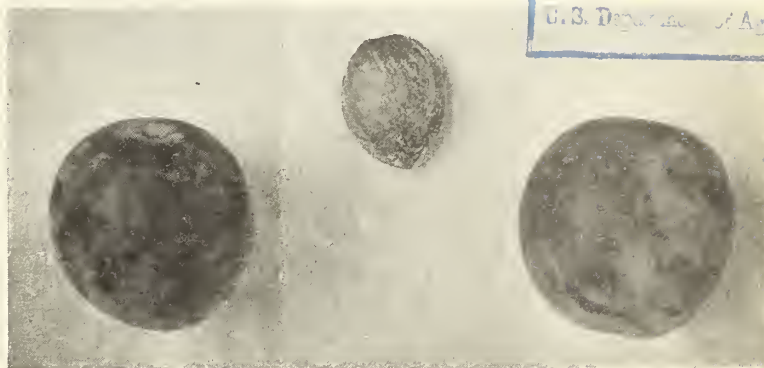
THE PEMBINA PLUM

Offered for the first time. Pedigree: Manitoba wild plum x Red June plum pollen. The Red June is one of the earliest and best plums, imported many years ago from Japan.

Available stock 36 trees, one year buds on native Americana plum roots. Price, each \$1.00.

LATE PLUMS FOR THE SOUTH

We have raised many seedlings of the Sand plum of Kansas, *Prunus Watsoni*. They are interesting trees of dwarf habit bearing profusely of good fruit which varies greatly in size and quality. Two of my hybrids with the Wolf plum are now offered as being worthy of trial in the south since they ripen after all other plums are gone but yet early enough to escape frost year after year. I judge these new plums should not go much north of Brookings as they may not ripen. But for the southern part of the state they are worthy of trial as a distinct new departure in plums. The names are given in honor of old Indian tribes in the Sand plum region.



THE KAW PLUM

Offered for the first time. Pedigree: *Prunus Watsoni* x Wolf plum pollen. The color is a pleasing bright dark red with firm skin with fine white dots and white bloom and peculiar crisp texture of yellow flesh. The quality is pleasing to all who have tried it.

Price of trees, one year old on native Americana plum roots, each \$1.00.

THE KIOWA PLUM

Offered for the first time. Pedigree: *Prunus Watsoni* x Wolf plum pollen. Much like the Kaw. Perhaps only one will be needed.

Price of trees, one year old on native Americana plum roots, each \$1.00.

A New Hardy Cherry for the North

THE MOSCOW CHERRY

The prairie Northwest greatly needs a hardy cherry. In the course of my five tours to Russia I became greatly interested in the cherry grown in the Vladimir region of Russia just east of Moscow. The fruit comes to the markets of Moscow in immense quantities. Near Moscow, on the Sparrow Hills where Napoleon stood in 1812, there are some interesting orchards of these cherries which I visited in 1894 and 1897. These cherries are grown mostly from root sprouts and seeds. The type, however, is not as constant as was thought at first, but varies considerably. Out of a lot of my imported seedlings I have selected one and named it Moscow which is now offered for the first time as budded trees, as it would take too many years to work up a stock of the cherry on its own roots. The following trees are offered as one year buds on Mahaleb roots. This means that at the North they must be mulched carefully to prevent root-killing. As soon as possible, the Northern native Pin cherry should be tested as a budding stock. Out of a large number of cherries tested at this Station, Moscow is the only one that has borne fruit in satisfactory quantities. The tree is productive and perfectly hardy. The fruit is of medium size, bright red with light colored juice of good quality.

Trees, each 50 cents.

Blight--the Greatest Enemy to the Pear

BREEDING PEARS IMMUNE TO BLIGHT

The experiments in breeding pears immune or resistant to blight are described in Bulletin 159 of this Station. In the spring of 1915 scions of 39 varieties were distributed to 24 men in four different states. The later development of this work I noted in the Minnesota Horticulturist for August, 1916, and in the 13th report of the S. D. State Horticultural Society. Since the publication of Bulletin 159 the tree called *Pyrus sinensis* or *Pyrus Simonii* has been separated from the other Chinese pears by Alfred Rehder into a new species and is now called *Pyrus ovoides*. The past three years 1914-15-16 have been marked by

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the most severe invasion of blight in the history of the Station. No attempt was made to cut out the affected pear, apple and crab apple trees so these resistant pear seedlings have had every opportunity to blight standing as they are in the same row with the blighted trees. None of these new seedlings have borne fruit, but it is deemed best to send out some one year trees under restrictions since it is highly important to determine as soon as possible their resistance to blight under all conditions. The original trees of *Pyrus betulifolia* suffered severely from blight the past season, so that the series of hybrids with this species, N. E. H. 1-13, inclusive, will be held awaiting further developments. Most of the *Pyrus oboidea* hybrids, N. E. H. 14-39 inclusive, are still very promising as they have proven resistant against blight the past three years. The trees are one year old buds on Japan pear and seedlings of Japan pear, Kieffer pear, or French pear. My opinion at present is that the Japan pear will be the best commercial stock. This agrees with experience on the Pacific coast where the Japan pear which is also a form of the Chinese sand pear, *Pyrus Sinensis*, is found to be blight-resistant. My present impression is that the Japan pear stocks are not fully hardy, so the young trees will need to be carefully mulched over winter to guard against root-killing. The varying hardiness of the Japan pear seedlings, as grown from imported seed, is no doubt due to the large area over which seed is gathered, the Northern type being hardier than the Southern type. The present indications are that the *Pyrus Ussuriensis* from the Pacific coast section of Siberia will be the coming pear stock as the tree is absolutely hardy and very strongly resistant to blight. My experience with the Japan pear seedlings is that they make a fine growth in nursery, and take buds easily. But the winter of 1915-16 was one of deep snow so we could not give it the fair test as to whether mulching or not mulching made much difference.

Terms: These new hybrid pears have not fruited, so that only a small charge is made to help cover the cost of propagation. The fruit cannot be expected to be smaller than that of *Pyrus oboidea* itself, which, although only one and five-eighths inches in diameter, is sweet, juicy, and of fair quality.

Price of trees: 4 for \$1.00; 50 for \$10.00.

PYRUS USSURIENSIS, a wild pear from the Pacific coast section of Siberia. From my 1908 tour to Russia. This tree has proven perfectly hardy and very strongly resistant to blight. We have several importations including some by Frank M. Meyer as well as my own. The stock offered is some secured from my 1908 tour to Russia. This will probably be the hardy, blight-proof stock of the future so an orchard should be established as quickly as possible for raising seed from which to raise seedlings.

Scions only, 2 feet for \$1.00. Must be ordered before April first.

SORBUS AUCUPARIA EDULIS, an edible-fruited mountain ash from Russia. Fruit is sour, rather than bitter. From my 1906 tour to Russia.

Scions only, 2 feet for \$1.00. Must be ordered before April first.

PYRUS TORINGO

A dwarf crab native of Japan. Fruit the size of a pea, flowers white and blush. Grown mostly for ornament, but promising as a dwarf stock. Descended from the original stock imported by Prof. J. L. Budd from Russia.

One year seedlings, each 25 cents; 5 for \$1.00.

Progress With American Wild Crabs

GIANT WILD CRAB

Offered for the first time. Probably the largest wild crab found so far. Good specimens of the fruit run three inches in diameter and weigh four ounces. A brief note by W. H. Shroyer, of Sherrard, Illinois, calling attention to a large fruited wild crab, appeared in the Fruit Grower (St. Joseph, Mo., Nov., 1911, page 32). The article was illustrated with a cut of a specimen of the fruit. Early in December, 1911, I visited the original tree near Sherrard, Illinois, and obtained scions. The original tree was cut down in clearing out the brush some time in the winter of 1912-13, so it is fortunate that these scions were saved. As near as I could determine, the original tree of the Mercer (Fluke) wild crab was within about four miles of this place, but it had been grubbed out of the open pasture of native timber where it was found. In color and quality the fruit of the Giant is much like the other large wild crabs, such as Soulard and Mercer, and will be useful mainly for jelly, or for adding a quince-like flavor to common apple sauce.

Trees, 1 year old budded on common apple roots, each \$1.00.

A New Red-Jellied Siberian Crab

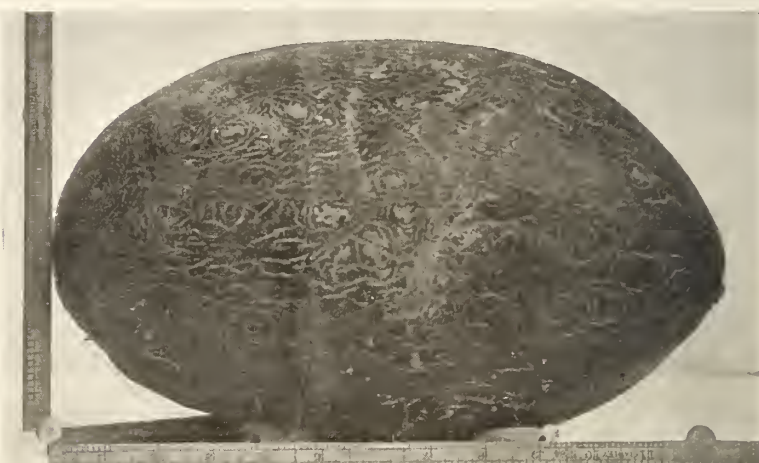
DOLGO CRAB

At the annual exhibits of this Department of the South Dakota State Fair many have asked about the remarkably long conical, intensely bright red crabs we used for making letters. This is one I brought over from my second trip to Russia in 1897. A vigorous productive tree and so far free from blight. Fruit full of juice, jells easily, makes a rich ruby red jelly of beautiful color and excellent flavor.

The one year old trees in nursery are of strong growth with wide spreading forks and strongly shouldered limbs, indicating that they will not split down easily. The trees are budded on common apple seedlings, so must be planted several inches deeper and carefully mulched over winter to prevent root-killing.

Tress one year buds on common apple roots, each 50 cents.

A New Muskmelon



HANSEN'S SIBERIAN MUSKMELON No. 3

Offered for the first time. Seed obtained on my 1913 trip to the Semipalatinsk Province, Siberia. The skin yellow, flesh white. Specimen illustrated weighed 11 pounds, and was shown at the South Dakota State Fair at Huron, September, 1916. This melon is very early and productive. As tested on sandy soil in Siberia the quality was delicious. Here on the heavy black soil the quality varies, some being good, others not so good. The quality of a muskmelon depends somewhat on the soil. Price of seed: Packet of about 150 seeds, 25 cents.

SIBERIAN CRABS FOR APPLE STOCKS

The Siberian Crab roots for the Apple to prevent root-killing and as a semi-dwarf stock

In Bulletin 65 of this Station I urged the trial of Siberian roots to prevent the root-killing which is often disastrous at the North. The experiments are still in progress. In 1915 we seeded fully 50 barrels of various Siberian crab apples and some one year seedlings can now be spared. These will be suitable for setting out in spring and budding in August. The main stock of seedlings now offered is from seed of the following varieties: Red Siberian, Gould Crab, Dartt's Hybrid, Whitney crab, and Yellow Siberian. Nos. 2 and 3 will be for lining out for budding next year. Price of No. 1 seedlings, 100 for \$1.00. Price on larger lots upon application. Have smaller sizes suitable for lining out for next year.

A Grain for the Driest Uplands



HANSEN'S WHITE SIBERIAN PROSO

Some will prefer to name this the Hansen White Millet. I found this large white-seeded grain millet among the Kirghiz Tartars near Semipalatinsk, Siberia, in 1913, who grow it extensively as a grain for themselves and their live stock. It is the corner stone of their agriculture in this eight inch rainfall climate, a sure crop in the driest years. For table recipes, see Bulletin 158 of this Station. A minister in Wyoming writes that the ladies of his parish tried with good results eight of these recipes, including pancakes, muffins, sour milk bread, griddle cakes, rolls and Boston brown bread. A farmer at Owanka, Pennington County, Western South Dakota, writes that he raised 300 pounds of grain from the one pound of seed sent him as a free premium in 1915. The first prize offered by this Society for 1916 was won by D. Betts, of Alexandria, South Dakota, who raised 115 pounds grain from one-half pound of seed. The past season we grew a small lot from hand-picked seed, the aim being to eliminate for table use the few grains of other colors mixed with the original stock as it came from Siberia. It was very slow and tedious work. One pound of seed sown in the spring means usually four to five bushels in the fall. A grain that will furnish good nutritious food for yourself and family and all your live stock in the driest years on the driest uplands of all our western states. A grain that at a pinch can be prepared for the table with a cheap coffee mill and sieve.

One pound seed, grown from hand-picked seed, price \$1.00.



Field of Hansen's White Siberian Proso, Brookings, S. D., 1914

SOME NEW ALFALFAS

COSSACK ALFALFA

1916 Crop: 1,000 bushels Seed

The strongest and best one of these hybrid alfalfas is the one I have named Cossack, noted in Bulletins 159 and 167. The Cherno alfalfa, sister plant of the Cossack, has been consolidated with the Cossack as it is not possible to distinguish between them. The small spoonful of seed which I obtained from Russia in 1906 and named the Cossack has been developed in the hands of many farmers so that the 1916 crop in the western part of South Dakota was fully One Thousand Bushels. Buyers for the leading seedsmen have been busy in these fields and the seed is now being offered. Many farmers have found by their own experience that the Cossack is the heaviest and best seeder of any alfalfa they have ever tested. The dry seasons of 1911, 1912, 1913 demonstrated the value of the Cossack. Very favorable reports of the Cossack come from many sections, including the far northwest prairie region of Saskatchewan, Canada.

Cossack plants 60 cents per 100; \$4.00 per 1,000.

SEMI-PALATINSK ALFALFA

Described in Bulletin 141 and 167. From the dry steppes of Semipalatinsk, Siberia. Some of the farmers who have had excellent results with this alfalfa on the driest uplands of the west now abbreviate this word to Semi. A variety of great vigor and especially adapted to transplanting into cultivated rows. It is not at its best the first season as it first makes its remarkable root system. It does its own subsoiling on hardpan. Flowers yellow. I find this to be the strongest in growth of all the varieties of *Medicago falcata*.

Strong plants grown from seed I gathered at Semipalatinsk in 1913. Plants by express at purchaser's expense, \$1.00 per 100; \$6.00 per 1,000. Seed \$2.00 per pound.

TRANSPLANTING ALFALFA

My machine method of transplanting alfalfa, first noted in Bulletin 141 and later in Bulletin 159, has now been brought up to date in Bulletin 167 which can be obtained upon application. It is a special method for the quick production of seed. It is interesting to note that, aside from small lots, the first large lot, one thousand pounds of Cossack alfalfa seed, was raised in 1913 by machine transplanting. By transplanting, one pound of seed is sufficient for twenty acres, instead of the old method of twenty pounds for one acre. When fully standardized and perfected, I believe it will be the means of reclaiming millions of acres of dry western uplands where present varieties and methods have been found unequal to the task.

NATURAL HYBRID ALFALFAS

In my bulletin 141 January, 1913, I made the following statement:

In Asia and southern Europe wherever the common blue-flowered alfalfa and the yellow-flowered alfalfa grow near together, the pollen is carried from one to the other by bees and other insects so that hybridization takes place freely. These hybrid alfalfas are sometimes called Sand Lucerns. Their number is legion and they consist of all sorts of mixtures in varying proportions of the yellow and blue alfalfas.

Since the *Medicago falcata* is very widely distributed in Europe and Asia, ranging in Asia from India north to above the Arctic Circle in Northeast Siberia, the plant varies greatly in its ability to resist cold, hence it follows that hardiness of this hybrid alfalfa must depend largely on the region from which it comes. Coming from the mild region of Southern Europe it could not be expected to be as hardy as if it came from drier and more severe climates. Hence while nature has indicated in the Sand Lucernes a method of increasing the vigor of alfalfa by hybridization, we do not know that this combination is the best one that it is possible to make. I now have at the Experiment Station at Brookings a large cosmopolitan collection of alfalfas and hope in the near future to originate still better varieties combining the best points of the alfalfas of the world.

HANSEN'S HYBRID ALFALFA No. 1

Offered for the first time. This variety was produced by transplanting the Semipalatinsk alternately with my Select Turkestan S. P. 1. 20711. The latter is characterized by wonderfully tall erect habit of growth. The seed was saved of the Semipalatinsk plants and instead of producing yellow flowers, I find that the work of hybridizing

is practically finished as fully 86 per cent of the plants come strongly variegated in many colors. Only 14 per cent come with yellow flowers which is the normal color of the Semipalatinsk. This original seed was sown in 1915 at the rate of 4 pounds per acre in 18-inch drills which we found was much too thick. The crop of 1916 was 7,200 pounds of hay on 1.4 acres or at the rate of 3.6 tons per acre in one cutting. The yield was really heavier but the frequent rains prevented getting all the crop. Owing to lack of room it is deemed best to offer plants to experimenters elsewhere. Price of two year old plants as they run, 50 for \$1.00.

HANSEN'S HYBRID ALFALFA No. 2

Offered for the first time. This originated from a single plant of the yellow flowered alfalfa, *Medicago falcata*, from Samara, Russia, S. P. I. 20721, with the typical sickle-shaped pod of the *Medicago falcata* but with blue flowers instead of the typical yellow flowers. Seed of this one plant was saved and the plants showed most wonderful variegation in colors of blossom. These plants proved proof against killing frost June 9, 1915, when common alfalfa was badly hurt. Seed, price per packet of about 100 seeds, 50 cents.

HANSEN'S WHITE FLOWERED ALFALFA

While the hybrid alfalfas with the variegated flowers have shown wonderful hardiness and productiveness, it would be an advantage if they could be bred with a definite outstanding characteristic by which they could be readily recognized. For example, an alfalfa with white flowers would have in this color a distinctive trade mark that would protect against misbranding and substitution in the sale of seed. This would be much the same as the Hereford cattle breeders putting a white face on their breed to serve as a trade mark. Holstein cattle are known by the black and white color, Hampshire swine are known by the white belt. Many other cases might be mentioned. In the case of alfalfa it would be difficult to keep this seed pure, even after the type is fixed, since the flowers cross-fertilize so readily. But it could be done by suitable care as to the location of seed plantations. The Cossack alfalfa exhibits strong tendency to light-colored variegation, and even to pure white flowers. For several years I have been endeavoring to select a white flowered alfalfa that would also be as hardy and productive as any of the others. Some of my correspondents report white flowers in the new alfalfas but that the colors do not come true. It is evident that careful selection must be practiced.

The variety here offered distinguishes itself by strong upright growth and productiveness both as to forage and seed. It is a beginning only. From last spring's experience we find that the seed comes fully 70 per cent true to the white color, but the work may easily be completed. Owing to lack of room the seed is now offered to experimenters elsewhere. The seed may be sown in rows and the plants transplanted after one year's growth as described in my Bulletin 167. The plants that do not come true as to white color of flowers should be removed as soon as they show the off color. This variety originated as a seedling of the Yellow-flowered alfalfa, *Medicago falcata*, from Omsk, Siberia, grown closely adjacent to the Cossack.

Offered for the first time. Price per packet of about 100 seeds, 50 cents.

SIBERIAN WHITE SWEET CLOVER

As found in cultivation the common white sweet clover, *Melilotus alba*, is a native of western Europe. In my 1913 trip to the Semipalatinsk Province, Siberia, I found this species a common plant on the dry steppes with 8 inches of annual rainfall, with temperature ranging from 50 degrees below zero Fahrenheit in winter to 106 degrees above in summer. The plants are extremely vigorous. This seed may or may not be better than the ordinary white sweet clover, but should be given a trial in the driest sections. A few seeds of the yellow flowered sweet clovers, *Melilotus officinalis* and *dentatus*, may be found mixed with this stock. They can easily be saved separately. A few pounds of Siberian White Sweet Clover is available at \$1.00 per pound. This seed will be sent at planting time and run thru the Svalof preparator or seed scratching machine just before shipping. Such seed must be planted at once and not kept over.

SIBERIAN RED CLOVER

I found this growing wild along the Irtysh River in the Semipalatinsk Province of Siberia in 1913. The growth indicates that it is only for the far North where winter-killing is more of a factor than further South. A few pounds of Siberian Red Clover are available at \$1.00 per pound. This seed will be run thru the Svalof preparator or seed scratching machine just before shipping. Such seed must be planted at once and not kept over.

DAGHESTAN YELLOW SWEET CLOVER

Melilotus officinalis from Daghestan Province, Transcaucasia, bordering on the Caspian Sea. "Considered as a very good fodder plant." This is S. P. I. 20682 from my 1906 tour to Russia. Good abundant foliage and a free seeder. Seed, per ounce packet, 50 cents.

HANSEN'S SAMARA PERENNIAL CLOVER

First noted in my list for 1912. A copy of this description sent upon request. A perennial red clover native of the dry steppes of the Volga region and east European Russia. It is *Trifolium alpestre* Crantz; (S. P. I. 20654) from my 1906 tour. Fine plant but we find difficulty in getting even germination of seed. Freezing or sulphuric acid treatment of seed will probably solve the problem.

Seed per ounce packet, 50 cents.

TERMS

Cash with order. Add 25 cents for moss and packing for orders less than \$3.00. This money helps to pay for field labor and enables this Department to carry on the work of Plant Breeding on a larger scale than would otherwise be possible.

PROF. N. E. HANSEN,
State College, Brookings, South Dakota.

Special Offer--Double Value for Your Money

LIST OF FREE PREMIUMS

Offered by the South Dakota State Horticultural Society until
May 1, 1917

The Legislature has made this Society the Department of Horticulture for South Dakota and has fixed the price of annual membership at \$1.00. The reports are published by the state, but aside from the State official list, the report is sent only to members. This provides a fund to help pay the running expenses of the Society.

The Society wishes to increase its membership.

Select One Dollar's worth of seeds, plants or trees from the foregoing list. The order must be received before May 1, 1917. As the supply of some of these premiums is very limited mark your second choice. One of the annual reports will be sent you at once. One book and one free premium will be sent postpaid for each \$1.00 received. Here is a good chance to get a valuable library of books on South Dakota trees, fruits and gardening.

BOOK AND KNIFE PREMIUMS

In place of seed and plant premiums, the following are offered. But the offer may be withdrawn at any time without notice, so hurry up your order:

Select ONE of the following list for each annual membership:

- No. 1. 1 back volume of the Annual Report of this Society.
- No. 2. Vegetable Gardening, 246 pages, paper cover, by the late Prof. S. B. Green, University of Minnesota.
- No. 3. Popular Fruit Growing, 323 pages, paper cover, by the late Prof. S. B. Green.
- No. 4. Evergreens, "How I Grow Them," 95 pages, paper cover, by C. S. Harrison, and "Windbreaks and Shelter Belts," 69 pages, paper cover, by the late Prof. S. B. Green.
- No. 5. 1 grafting knife as is used by nurserymen. This knife is made of the best quality razor steel. If desired, sample whip and top grafts, and sample of grafting wax with directions for preparation, will be sent any time during February and March.
- No. 6. 1 budding knife such as is used by nurserymen. This knife is made of the best quality razor steel. If desired, a sample of buds will be sent during the first week in August with sample of raffia, an imported palm fibre used for tying buds.

SPECIAL OFFER UNTIL MAY 1, 1917

The life membership is fixed by the Legislature at Ten Dollars. It is highly desirable that the Society has more life members as they are our permanent source of strength and influence. Residents of South Dakota who become life members may select Ten Dollars worth of trees, plants, seeds or other premiums from this circular as a free premium. This includes a set of 12 annual reports now issued and one annual report as issued. All premiums sent by express at customer's expense.

Address, PROF. N. E. HANSEN,
Secretary South Dakota State Horticultural Society,
Brookings, South Dakota.